

Cardiac Imaging

Main Pulmonary Artery Thrombus

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An 84-year-old woman was referred to our echocardiography department for transthoracic echo evaluation of recurrent episodes of syncope and haemodynamic instability during the previous 24 hours. Her medical history included cholecystectomy, thrombophlebitis of the lower extremities, two episodes of pulmonary embolism, and arterial and pulmonary hypertension. During this current admission in the internal medicine clinic of our hospital, the patient was diagnosed as having distal choledochal duct stenosis highly suggestive of cholangiocarcinoma and had been treated for repeated episodes of cholangitis. Physical examination revealed a patient who was lethargic, tachypnoeic, tachycardiac, with low blood pressure, distended neck veins and a grade 4/6 systolic murmur at the lower left sternal border. The electrocardiogram was indicative of pulmonary embolism, presenting sinus tachycardia with right bundle branch block and an sI qIII TIII pattern that were absent on admission.

The echocardiographic examination revealed the presence of a large mass in the main pulmonary artery, just above the leaflets of the pulmonary valve, that was obstructing pulmonary blood flow (Figure 1). The mass was immobile, with irregular borders and a non-homogeneous structure consistent with thrombus. The right ventricle was dilated with depressed contractility.

The maximum velocity of the tricuspid valve regurgitation jet was 315 cm/s, which

represented a gradient between right ventricle and right atrium of 40 mmHg (Figure 2). The inferior *vena cava* and hepatic veins were dilated and there was no collapse with inspiration, while left ventricular function was normal. In addition to the pulmonary artery obstruction as a cause of the significant haemodynamic instability, the diagnosis of pulmonary embolism could not be excluded. The patient was transferred to the cardiology clinic, where she was treated with supplemental O₂, fluid administration, and subcutaneous injections of low molecular weight heparin, in addition to her initial treatment. Alternative therapeutic strategies, such as thrombolysis or thrombectomy had relative contraindications because of the active bleeding in the choledochal duct stenotic lesion with a high suspicion of cholangiocarcinoma.

During the following days, the patient showed progressive clinical improvement. Subsequent transthoracic echo studies performed five days and two weeks after the initial evaluation revealed a gradual decrease (Figure 3) and complete disappearance (Figure 4) of the mass, while the right ventricular function improved. The patient was discharged on coumadin therapy.

The findings from the echocardiographic study established the diagnosis of obstruction of the main pulmonary artery with possible subsequent pulmonary embolism due to thrombus formation. The visualisation of thrombus within the right cavities of the heart is not common, while

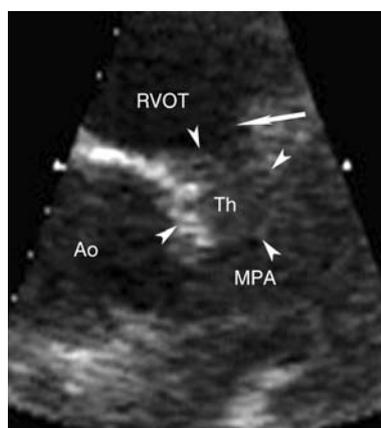


Figure 1. Transthoracic echocardiogram, left parasternal short axis view. The arrowheads indicate the thrombus (Th) in the main pulmonary artery (MPA) and the arrow shows the pulmonary valve. Ao – aorta; RVOT – right ventricular outflow tract.

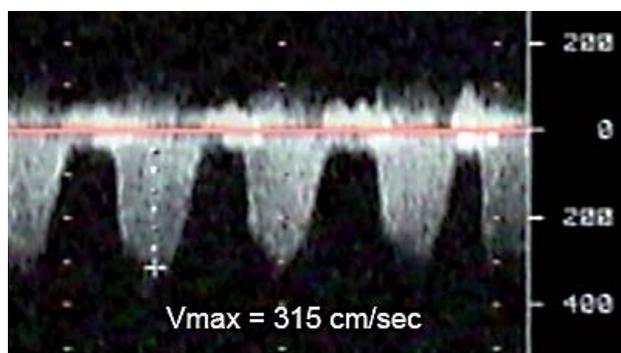


Figure 2. Continuous Doppler through the tricuspid valve. The maximum velocity of the tricuspid valve regurgitation jet was 315 cm/s and the estimated pulmonary artery systolic pressure was above 60 mmHg.

within the pulmonary artery it is extremely rare.^{1,2} In cases of massive pulmonary embolism when thrombi are identified in the central parts of the pulmonary tree, they are usually located in the right or left pulmonary artery. When thrombi are visualised in the main pulmonary artery, they are usually located in its distal part near the bifurcation, and in many cases extend to one or both of its main branches (right or left pulmonary artery).³⁻⁵ Rare cases of pulmonary artery thrombosis have been reported in patients with antiphospholipid syndrome.⁶ It is noteworthy that this patient had no laboratory findings of connective tissue disease, antiphospholipid syndrome or abnormal clotting.

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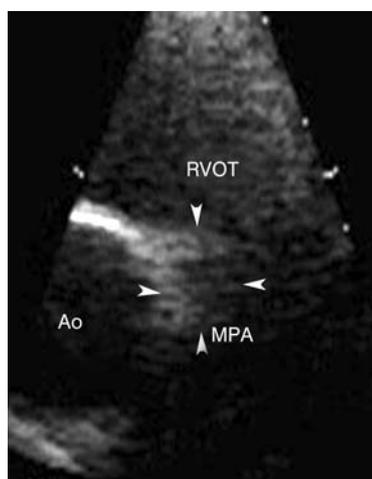


Figure 3. Left parasternal short axis view, showing decrease in the thrombus mass (arrowheads) in the subsequent transthoracic echo study five days later. Abbreviations as in Figure 1.

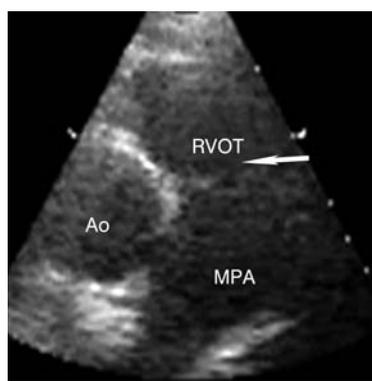


Figure 4. Left parasternal short axis view. Complete disappearance of the thrombus in the main pulmonary artery after two weeks of anticoagulation treatment. The arrow indicates the pulmonary valve. Abbreviations as in Figure 1.

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